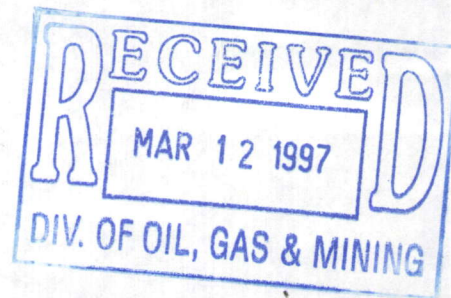


M/027/006



HAND DELIVERED
AT MT6.

ATTACHMENT B

CRICKET MOUNTAIN VEGETATION INVENTORY

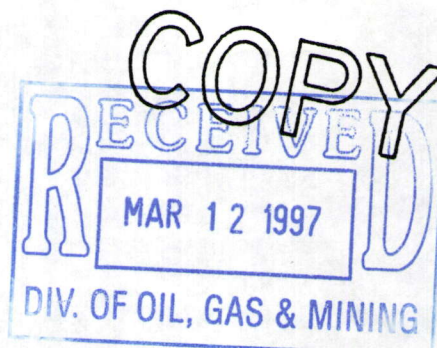


270 East 1230 North • Springville, UT 84663 • (801) 489-4590 • Fax (801) 489-8236

m/027/006

11 December 1996

Jeff Parshley
Steffen, Robertson and Kirsten, Inc.
1755 East Plumb Lane, Suite 241
Reno, Nevada 89502



RE: Cricket Mountain Vegetation Inventory

Dear Jeff:

Three vegetation types were determined for the Project area on 5 August 1996: Juniper woodland, Great Basin sagebrush and a subtype found on limestone bedrock which includes scattered junipers, cliffrose and needleleaf mountain mahogany. Tueller et al. (1979) sampled pinyon-juniper woodland in the Great Basin and showed average total cover for seven Utah Ranges at 32.8 %. At 1800 m, the approximate elevation of the study area (5600-6400 ft) he found about 28.0 % total cover. Of course, these values are for pinyon and juniper, and only juniper was found at the study area but these value are probably the best estimates until we can sampled later this year. Total vegetation cover for the scattered junipers and shrubs on bedrock is probably 10 to 15 %

Regarding the sagebrush type, West (1988) states that big sagebrush (*Artemisia tridentata* var *tridentata*) composes more than 70% of the relative vegetation cover and 90% of the phytomass regardless of the successional status. I would estimate the total cover at somewhere between 30 and 40% depending on the site. I hope these estimates are adequate and the best time to sample this year is probably around June 1.

Best wishes for 97,

Ron Kass

Intermountain Ecosystems, L. C.
Ronald J. Kass, plant ecologist

Post-It™ Fax Note	7671	Date	12-11-96	# of pages	2
To	JEFF Parshley	From	Ron Kass		
Cn./Depl.	SRK	Co.	Intermt Eco		
Phone #		Phone #			
Fax #	702-786-4435	Fax #			

SENSITIVE PLANT INVENTORY
CRICKET MOUNTAIN PROJECT, UTAH

FOR:

CONTINENTAL LIME, INC.
P. O. BOX 669
DELTA, UTAH 84624

AND

STEFFEN ROBERTSON AND KIRSTEN (U.S), INC.
7175 WEST JEFFERSON AVE., SUITE 3000
LAKEWOOD, COLO. 80235

BY:

INTERMOUNTAIN ECOSYSTEMS, L. C.
270 EAST 1230 NORTH
SPRINGVILLE, UTAH 84663

7 AUGUST 1996

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1.0 INTRODUCTION

1.1 Project Description and Scope

Endangered Species Act of 1973 declares that all federal agencies seek to conserve threatened and endangered species (T&E) and utilize their authorities in upholding the Act. Section 7 of the Act mandates programs for conserving listed species and preserving habitat. Furthermore, the Bureau of Land Management's (BLM) sensitive plant policy (Manual 6840) mandates conservation of threatened and endangered species, and collection of biological data on "species at risk", formerly known as candidate species.

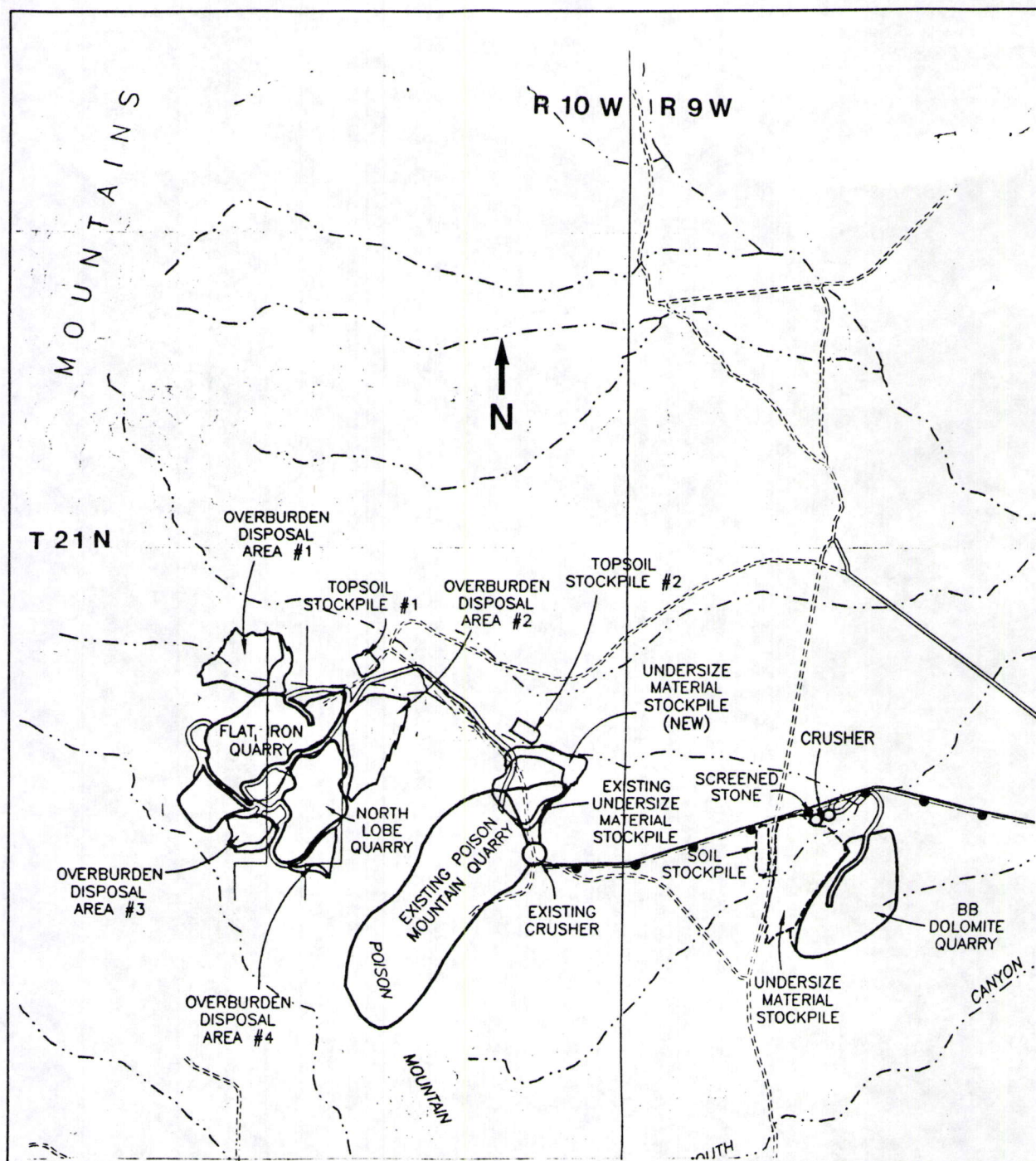
BLM, Fillmore Area Office, has requested Continental Lime, Inc. to conduct a sensitive plant inventory on the proposed Cricket Mountain Expansion Project, located at Cricket Mountain in Millard County, Utah. The proposed project consists of developing the BB Dolomite Quarry, West Quarry, and expansion and development of previously undisturbed land for quarries, overburden stockpiles, undersize material stockpiles, crusher, and haul roads (Fig. 1). Proposed action requires removal of existing vegetation which could possibly impact sensitive plant species if they occur in the project area.

Sensitive plants of concern are: inch-high milkvetch (*Astragalus uncialis*), Compact cateye (*Cryptantha compacta*), Ibex buckwheat (*Eriogonum nummulare* var. *ammophilum*), Tunnel Springs beardstongue (*Penstemon concinnus*), and Jones globemallow (*Sphaeralcea caespitosa*). Inch-high milkvetch is known to occur at Long's Ridge about 25 miles north of the project area (Kass 1992). Compact cateye is known to occur in western Millard County near the Desert Experiment Range and Ibex buckwheat is known to occur at Sand Pass about 40 miles north of the project area (Kass 1992). Tunnel Springs beardstongue and Jones globemallow are known to occur in western Millard and Beaver Counties (Kass 1992).

1.2 Physiography, Geology and Climate

Project area is located in the Cricket Mountains, which lies in the Basin and Range Physiographic Province (Hunt 1974). Geology is mainly Cambrian limestone and dolomite (Stokes 1988). Steep hogback ridges, slopes, and gentle sloping washes are characteristic of the Flat Iron, North Lobe Quarries, and Overburden Disposal Areas #1, #2, and #3. Topsoil Stockpiles #1 and #2 are located on alluvial fans of Quaternary origin. Haul roads are generally limited to washes and gentle sloping valleys (fig. 1).

BB Dolomite Quarry is located on the east portion of the project area (fig. 1). It is a long, moderately steep, hogback ridge extending north and south with intervening strike valleys to the east and west. Project area elevation ranges between 5,400 and 6,200 feet and mean annual precipitation recorded at Delta, Ut. is 16.7 cm. (6.7 inches) (Eubank 1979). Onsite precipitation is probably 20 to 25 cm (8 to 10 inches) (per. obs. Kass 1996).



**CONTINENTAL LIME, INC.
CRICKET MOUNTAIN PROJECT, UT.**

Fig. 1. Map of the Project Area.

1.3 Plant Associations

Plant associations in the project area are juniper woodland and Great Basin sagebrush (West 1988). Utah Juniper (*Juniperus osteosperma*) dominates most aspects throughout the project area while pinyon pine (*Pinus edulis*) is relatively absent. Junipers are approximately 1-2 meters tall and increase in density on steep slopes. Black sagebrush (*Artemisia nova*), Nevada ephedra (*Ephedra nevadensis*), Salina wildrye (*Elymus salinus*) and bluebunch wheatgrass (*Elymus spicatum*) are often found growing on steep open slopes in association with juniper.

On steep limestone hogbacks, scattered junipers, cliffrose (*Cowania mexicana*), needle-leaf mountain mahogany (*Cercocarpus ledifolius*), rock spirea (*Petrophytum caespitosum*), low goldenbush (*Haplopappus nanus*) are the dominant plant species. Common grasses associated with the juniper woodland include Indian ricegrass (*Oryzopsis hymenoides*), needle and thread (*Stipa comata*), and galleta grass (*Hilaria jamesii*).

Big sagebrush (*Artemisia tridentata*) and snakeweed (*Gutierrezia sarothrae*) are common in washes and alluvial fans in the valley bottoms. In the past century, sagebrush steppes were heavily grazed and have displaced perennial grasses (West 1988). Adventive annuals such as cheatgrass (*Bromus tectorum*), musk mustard (*Chorispora tenella*), storksbill (*Erodium cicutarium*), halogeton (*Halogeton glomerata*) and Russian thistle (*Sasola pestifer*) are common in the project area, especially on gentle sloping terrain.

2.0 METHODS

A herbarium and literature search was conducted on 5 August at the Brigham Young University Herbarium. Field inventory was conducted on 6 August 1996 by Ronald J. Kass, botanist from Intermountain Ecosystems. Standard methodology included walking linear transects in areas of high and moderate potential habitat. Low potential habitats were also inventoried, and a comprehensive species list was compiled (Appendix A). Prolonged drought conditions in the Great Basin precluded growth of many herbaceous plant species, and consequently, the species list is somewhat under-represented (pers obs. Kass 1996).

If encountered, T&E or sensitive plants were pin-flagged with pink flags. If individuals were found, the remaining habitat was searched and individuals were flagged, counted, and the population boundary was delimited. Habitat and abundance data was recorded on a standard habitat-data form. Plant occurrences were mapped on a 7.5 min. USGS quad and project area map (scale= 1":300 ft.). A photograph of plant and habitat was taken. Nomenclature generally follows Welsh et al. (1993).

3.0 INVENTORY RESULTS

ASTRAGALUS UNCIALIS BARNEBY

Family: Fabaceae

Common name: Inch-high milkvetch

Status: Species at risk

Original citation: Barneby, R. P. 1942. Leaflets of Western Botany 3:101. Type: Ripley and Barneby, northeastern Nye County, Nevada, 5300 ft., 22 May 1941.

Habitat and phenology: Dry knolls and slopes, saline sands or clays usually with desert pavement. Shadscale and budsage communities at elevations of 1402-1615 meters (4600-5300 ft.). Flowering time is April and May.

Historic distribution: Northern Nye County, Nevada, and about 30 miles southwest of Delta Ut. at Long's Ridge.

Inventory findings: Marginal desert pavement was present around Topsoil Stockpile #2 but inch-high milkvetch was not found. Low potential habitat exists in the surrounding areas.

ERIOGONUM NUMMULARE JONES VAR. AMMOPHILUM (REVEAL) WELSH

Family: Polygonaceae

Common name: Ibex buckwheat

Status: Species at risk

Original citation: Reveal, J. L. 1972. Phytologia 23:163. Type: Ibex Warm Point, Confusion Range, Millard Co. Ut. Homlgren & Holmgren 4650.

Habitat and Phenology: This plant occurs on aeolian sands in salt desert shrub and pinyon-juniper zones. Elevation range is 1585-1890 meters (5200-6200 ft.). Flowering time is June and July.

Historic distribution: Tule, Whirlwind, and Snake Valleys; Ferguson Desert, Millard and Juab Counties, Ut.

Inventory findings: No sandy areas exist in the project area, therefore, Ibex buckwheat was not found.

CRYPTANTHA COMPACTA HIGGINS

Family: Boraginaceae

Common name: Compact cateye

Status: Species at risk

Original citation: Higgins, L. 1968. Great Basin Naturalist 28:196-97. Type: Millard Co., Utah. 8 miles W. of the Desert Experiment Station, (Higgins 1613).

Habitat and phenology: Dry open slopes, rock outcrops, and barren clay soils in mixed desert shrub, pinyon-juniper, and mountain shrub zones. Elevation range is 1350-2900 meters (4428-9512 ft.). Flowering time is May and June.

Historic distribution: Desert Experiment Range, Millard County.

Inventory findings: *Cryptantha humilis*, a near relative of *C. compacta*, was found at the BB Dolomite Quarry, but *C. compacta* was not located.

PENSTEMON CONCINNUS KECK

Family: Scrophulariaceae

Common name: Tunnel Springs beardstongue

Status: Species at risk

Original citation: Keck, D. 1940. American Midland Naturalist 23:608. W. P. Cottam, 5635. Type: Tunnel Springs, ca 10 miles E. of Garrison, 1675 meters elev., Millard Co., Ut. 28 June 1933.

Habitat and phenology: Gravelly bluffs, limestone and dolomite outcrops in mixed desert shrub, sagebrush, and pinyon-juniper zones. Elevation range is 2047-2460 meters (6240-7500 ft.). Flowering time is June.

Historic distribution: Tunnel Springs, Mountain Home, Burbank Hills and Wah-Wah Mountains; Millard and Beaver Counties, Utah; Snake Range, White Pine Co., Nevada.

Inventory findings: Tunnel Springs beardstongue was not found in the project area.

SPHAERALCEA CAESPITOSA JONES

Family: Malvaceae

Common name: Jones globemallow

Status: Species at risk

Original citation: Jones, M. E. 1908. Contributions to Western Botany 12:4.

Habitat and phenology: Restricted to limestone and dolomites slopes, especially the Sevy Dolomite Formation in salt desert shrub and pinyon-juniper zones. Elevation range is 1524-1981 meters (5000-6500 ft.). Flowering time is June-July.

Historic distribution: Desert Experiment Range, Millard County, Ut.

Inventory findings: Jones globemallow was not found in the project area but potential habitat exists on limestone and dolomite outcrops.

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COMMON NAME	SCIENTIFIC NAME	ABUNDANCE
Trees		
Utah juniper	<i>Juniperus osteosperma</i>	Common
Shrubs		
Black sagebrush	<i>Artemisia nova</i>	Common
Big sagebrush	<i>Artemisia tridentata</i>	Common
Shadscale	<i>Atriplex confertifolia</i>	Frequent
Winterfat	<i>Ceratoides lanata</i>	Frequent
Needle-leaf mt. mahogany	<i>Cercocarpus ledifolius</i>	Infrequent
Rabbitbrush	<i>Chrysothamnus nauseosus</i>	Frequent
Cliffrose	<i>Cowania mexicana</i>	Common
Nevada ephedra	<i>Ephedra nevadensis</i>	Frequent
Snakeweed	<i>Gutierrezia sarothrae</i>	Common
Pepperweed	<i>Lepidium montanum</i> var. <i>montanum</i>	Common
Littleleaf horsebrush	<i>Tetradymia glabrata</i>	Frequent
Forbs		
Torrey milkvetch	<i>Astragalus calycosus</i> var. <i>calycosus</i>	Infrequent
Rough brickellbush	<i>Brickellia microphylla</i> var. <i>watsonii</i>	Infrequent
Musk mustard	<i>Chorispora tenella</i>	Frequent
Drawf cryptantha	<i>Cryptantha humilis</i>	Infrequent
Claret cup cactus	<i>Echniocereus triglochidatus</i>	Frequent
Vernal daisy	<i>Erigeron pumilus</i> var. <i>concinoides</i>	Infrequent
Cushion buckwheat	<i>Eriogonum ovalifolium</i> var. <i>ovalifolium</i>	Infrequent
Storksbill	<i>Erodium cicutarium</i>	Frequent
Halogeton	<i>Halogeton glomerata</i>	Common
Low goldenbush	<i>Haplopappus nanus</i>	Frequent
Hyalineherb	<i>Hymenopappus filifolius</i>	Frequent
Stemless woollybase	<i>Hymenoxys acaulis</i>	Infrequent
Sharp slenderlobe	<i>Leptodactylon pungens</i>	Frequent
Milfoil lomatium	<i>Lomatium grayii</i>	Frequent
Prickly-pear cactus	<i>Opuntia polycantha</i>	Frequent
Stansbury rock-daisy	<i>Perityle stansburiana</i>	Frequent
Rock spirea	<i>Petrophytum caespitosum</i>	Common
Desert phlox	<i>Phlox austromontana</i>	Infrequent
Tumbleweed	<i>Sasola pestifer</i>	Frequent
Globemallow	<i>Sphaeralcea grossulariifolia</i>	Common
Showy townsendia	<i>Townsendia florifer</i>	Infrequent

COMMON NAME	SCIENTIFIC NAME	ABUNDANCE
Grasses		
Squirreltail	<i>Elymus elynoides</i>	Common
Intermedium wheatgrass	<i>Elymus hispidus</i>	Infrequent
Salina wheatgrass	<i>Elymus salinus</i>	Common
Purple threeawn	<i>Aristida purpurea</i>	Frequent
Cheatgrass	<i>Bromus tectorum</i>	Common
Galleta	<i>Hilaria jamesii</i>	Frequent
Muttongrass	<i>Poa fendleriana</i>	Infrequent
Sandberg bluegrass	<i>Poa sandbergii</i>	Frequent
Needle and thread	<i>Stipa comata</i>	Frequent
Indian ricegrass	<i>Stipa hymenoides</i>	Common